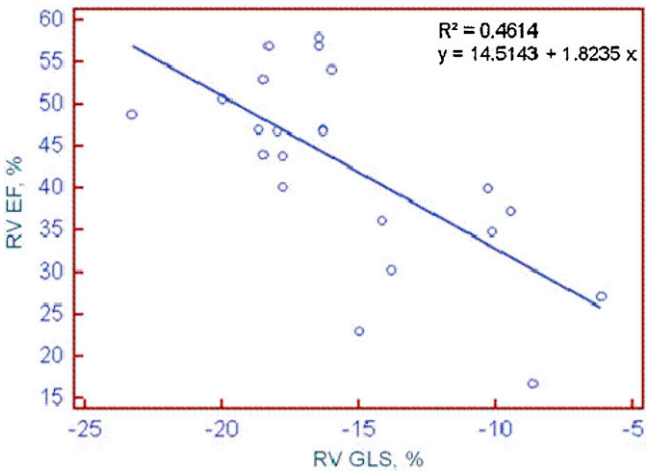

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07

Echocardiographic predictors of cardiovascular events in a population of subjects aged over 65 years: Preliminary results

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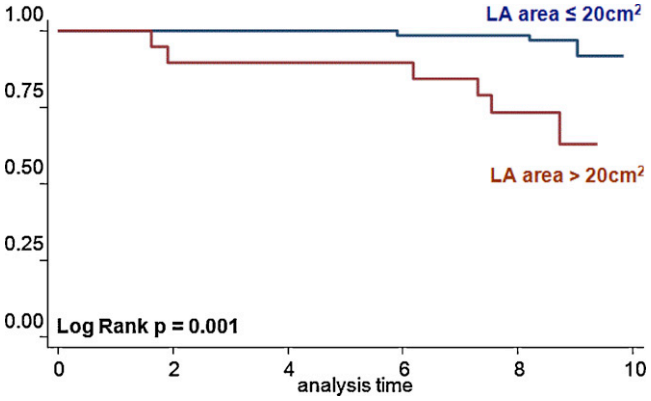
Background.— The left atrium is a marker of clinical and subclinical cardiovascular disease. The additional role of left atrial (LA) and left ventricular (LV) speckle-derived strain parameters has not been assessed in an aged population, included in a prospective cohort of subjects with a long-term follow-up.
Objectives.— To determine whether LV and LA global strain is a predictor of cardiovascular events in a population, beyond other clinical and morphological characteristics.
Methods and results.— The COVADIS study aims to analyse the relationship between cardiac and cerebral ageing, studied multidimensionnally (biology, MRI, echocardiography), and the determinants of cognitive impairment. We performed a complete echocardiographic examination and measured LV and LA peak systolic global longitudinal strain using a semi-automatic speckle tracking software in 85 subjects aged over 65 years. The endpoint was a composite cardiovascular (CV) criterion of coronary event, stroke or death. In univariate analysis, the main predictors of CV events are depicted in the table. The Kaplan-Meier curves show that LA area > 20 cm^2 was associated with a higher risk of CV events. Multivariate analysis could not be performed due to the low number of CV events. LV and LA peak systolic global longitudinal strains were not associated with CV events.
Conclusion.— These early and preliminary results confirm the feasibility and reproducibility of deformation measurements in this population, although not associated with CV events, and is currently extended to a cohort of over 2000 patients.



Parameters	Univariate analysis HR (95% CI)	*P*
Age, years	1.04 (0.90—1.20)	0.596
Gender, female	0.13(0.03—0.63)	0.011
LA area > 20 cm^2	9.90 (2.37—41.41)	0.002
EDV indexed	1.06 (1.00—1.13)	0.051
LVEF (biplane)	0.92 (0.83—1.00)	0.044

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08

Ultrasound based teaching of cardiac anatomy and physiology to undergraduate medical students

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Background.— Ultrasonography is a non-invasive imaging modality that offers the opportunity to teach living cardiac anatomy and physiology. The objectives of this study are to assess the feasibility of integrating an ultrasound based course to the conventional undergraduate medical teaching program and to analyze students' and teachers' feedbacks.
Methods.— An ultrasound based teaching course was implemented and proposed to all second ear medical students ($n = 348$) at the end of the academic year and after all the conventional modules at our faculty. After a brief theoretical and practical demonstration, students were allowed to take the probe and use the ultrasound machine. Students and teachers were asked to complete a survey and were given the opportunity to provide open feedback.
Results.— Two months were required to implement the entire module and 330 (95%) students divided into 39 groups, and 37 teachers participated to the course. The students' feedbacks were very positive: 98% of them agreed that the course was useful; 85% and 74% respectively considered that their understandings of cardiac anatomy and physiology were improved. A majority of the teachers (97%) considered that the students were interested, 81% agreed that

the course was adapted to second year medical students and 84% were willing to participate to future sessions.
Conclusion.— Cardiac anatomy and physiology teaching using ultrasound to undergraduate medical students is feasible and enhances their motivation to improve their knowledge. Students' and teachers' feedbacks on the course were very positive.

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Session n° 2 — Valve diseases and endocarditis

09

Impact of the method used for aortic annulus measurement on transcatheter aortic valve implantation results — a transesophageal echocardiography and multislice computed tomography comparison

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Background.— Precise measurement of the aortic annulus diameter (AAD) is critical for successful implantation of transcatheter aortic valve (TAVI) but the most accurate method is still debated. We sought to compare immediate TAVI results according to whether transesophageal echocardiography (TEE) or multislice computed tomography (MSCT) measurement were finally used for the choice of the prosthesis size.
Methods.— We enrolled consecutive patients with severe aortic stenosis who undergone a TAVI with either the Edwards Sapien or the Medtronic CoreValve at our institution and had both TEE/MSCT measurement of the AAD. AAD was measured in long-axis view using TEE and at the level of the virtual basal ring (mean of long and short axis) using MSCT. Agreement was defined as the same choice of the prosthesis size according to manufacturers' recommendations using both TEE and MSCT. The primary endpoint was a composite of paravalvular regurgitation, second balloon inflation or second prosthesis implantation, and prosthesis migration. Complications were assessed according to VARC definitions.
Results.— We enrolled 177 patients (81.5 ± 9 years, 56.5% male, Euroscore 22%, ejection fraction < 50%: 37%, mean aortic valve area $0.76 \pm 0.20\,cm^2$ and mean gradient 51 ± 19 mmHg). Overall, mean AD was significantly larger using MSCT than using TEE (23.3 ± 1.9 vs. 24.6 ± 2.1 mm, $P < 0.0001$). An agreement between TEE and MSCT as regard to prosthesis size was achieved in 117 patients. Among the 60 patients in whom a disagreement between TEE and MSCT measurements was observed, prosthesis size was chosen according to TEE measurements in 55 and according to MSCT measurements in 5. Although not achieving statistical significance, the composite criteria was more frequent in the disagreement TEE-based group (23%) compared to the agreement group (11%) and the disagreement MSCT based group (0%) ($P = 0.09$). Paravalvular regurgitations were not significantly increased in the disagreement TEE-based group. There was no significant difference between the two groups concerning annulus rupture, but they were more frequent in the disagreement MSCT-based group.
Conclusion.— Our study suggests that when CT and TEE disagree, a TEE-based strategy seems to be associated with a higher rate of paravalvular regurgitation whereas a CT-based strategy may be associated with a higher rate of annulus rupture. Our results deserve further continuation and support the need for randomized study comparing CT/TEE based strategy.

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10

Non-invasive coronary flow reserve predicts response to exercise in asymptomatic severe aortic stenosis

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In patients (pts) with asymptomatic aortic stenosis (AS), exercise stress echocardiography (ESE) provides additional prognostic information beyond baseline. The coronary flow reserve (CFR) is impaired in AS but its link with exertion is missing in this setting. We hypothesize that CFR could predict exercise capacity and an abnormal exercise test in AS.
Methods.— Non-invasive CFR and symptom limited semi-supine exercise stress echocardiography (ESE) were performed the same morning in 20 consecutive pts with asymptomatic isolated severe AS (mean age 69 ± 12 years, 30% women, mean aortic valve area $0.8 \pm 0.1\,cm^2$, mean LVEF 70 ± 6%). CFR was performed in the distal part of the left anterior descending artery using intravenous adenosine infusion (140 μg/kg/min over 2 minutes). An abnormal ESE was defined as onset of symptoms at less than 80% of maximum predicted workload, ECG ST-segment depression ≥ 2 mm during exercise, rise of systolic blood pressure < 20 mmHg or fall in blood pressure, complex ventricular arrhythmia.
Results.— When compared to pts with normal ESE, pts with an abnormal ESE ($n = 9$) were older, had higher left atrial volume index (all, $P \leq 0.05$), and lower CFR (2.1 ± 0.3 vs. 2.9 ± 0.7, $P \leq 0.01$), whereas resting hemodynamic variables assessing AS severity were not significantly different between subgroups. Furthermore, CFR was significantly correlated to age, the change of transvalvular pressure gradient and LVEF with exercise, workload (in watts), and exercise duration (all, $P < 0.05$). After adjusting for age, and sex, CFR remained significantly correlated to exercise duration and workload (all, $P < 0.05$). Using a ROC curve analysis, a CFR < 2.17 was the best cut-off to predict an abnormal ESE with a sensitivity of 67%, a specificity of 90% (AUC = 0.8, $P < 0.01$).
Conclusion.— In pts with asymptomatic severe AS, non-invasive CFR is correlated to exercise duration and workload, and a low CFR predicts an abnormal ESE with a good accuracy.

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11

Heart failure as a complication of infective endocarditis: Clinical spectrum and prognostic features

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Objectives.— Infective endocarditis (IE) is still associated with a high in-hospital mortality rate of nearly 20%. Heart failure (HF) has been reported as the most common cause of death in IE requiring usually surgical management.
We aimed to analyze clinical characteristics as well as echocardiographic and microbiologic findings to determine prognostic factors and therapeutic implications of HF in patients with IE.
Patients and methods.— From January 1996 to December 2012, all patients with a Duke criteria-based definite diagnosis of IE in a Tunisian high volume tertiary-care centre were included. Clinical and echocardiographic findings, microbiological and therapeutic data were processed.
Results.— Among 284 patients with definite IE included in this analysis, 99 patients had HF (34.9%). Sex ratio was 0.65 (60 men and 39 women). Mean age was 37.3 ± 18 years. Forty-three patients (43.4%) had a history of rheumatic fever with cardiac impairment, 21 patients (21.2%) had valve prostheses. Physical examination had